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APPENDIX B

COMMUNICATIONS RESEARCH AND DEVELOPMENT DATA COLLECTION PROGRAM IN THE REPUBLIC OF VIETNAM (U)

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Third Semiannual Report
17 July 1966 — 15 January 1967

COMMUNICATIONS RESEARCH AND DEVELOPMENT DATA
COLLECTION PROGRAM IN THE REPUBLIC OF VIETNAM

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APPENDIX B

**COMMUNICATIONS PRACTICES AND PROBLEMS AMONG
U.S. AND ALLIED UNITS**

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ABSTRACT

This Appendix to the third Semiannual Report of the "Communications Research and Development Data Collection Program in the Republic of Vietnam" contains selected summaries from interviews with U.S. and Free World Forces units conducted by team members. It is not meant to stand alone but to be an integral part of the basic report which is being published separately so that it may be unclassified. The abstract of the basic report is as follows:

This paper summarizes the third six-month period of research by the Booz Allen Southeast Asia Operations field team in support of the Advanced Research Projects Agency small unit tactical communications project. It presents an initial analysis of Vietnamese patrol and base practices and discusses the on-going program of communications data collection among U.S. and Free World Forces units. It describes communications practices in use by some of these units and reports findings to date in the area of path physiography, radio frequency, and dialect analyses. It recommends the use of directional-type antennas for tactical very high frequency and describes a simple, lightweight concept which could be used by tactical units.

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INTRODUCTION

This appendix to the third Semiannual Report of the "Communications Research and Development Data Collection Program in the Republic of Vietnam" is not meant to stand alone, but to be an integral part of the basic report. It is published separately so that the basic report may be unclassified.

It contains selected summaries from interviews conducted by team members. These summaries are not necessarily the opinions of the authors, nor are they a compendium of all comments made. Rather, they are the consensus of the individuals interviewed within the unit noted. What appear to be discrepancies or even inaccuracies among the reports are, in reality, differences of opinion or differences in modes of operation among the various units.

The interviews are usually conducted in the field, often during an actual operation. The personnel interviewed generally were the Battalion Commander, the Battalion S-3, the Battalion Sergeant-Major, the Battalion Communications Officer and NCO, Company Commanders, Platoon Leaders and Company Radio Operators. Both communicators and non-communicators are included, thus reinforcing the validity of the comments from the users point of view.

Units visited by the study group have been shown in Table 9 of the basic document and are further presented by location in Figure B-1.

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FIGURE B-1

November 1966 - January 1967



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2/18 INFANTRY, 2nd BRIGADE, 1st INFANTRY DIVISION
December 1966

GENERAL

The battalion during this operation has been operating virtually independently. They are located in the Rung Sat special zone in the Saigon River delta, the inhabitants of which are predominantly Viet Cong. This region consists entirely of mud flats covered with marsh grass, mangrove swamps* and numerous small, tidal waterways. There are few places in the entire region that are above water level at high tide. As a result, operating in this area is a constantly wet and muddy proposition.

The battalion command post (CP) and one battery of 105-mm Howitzers are located with their backs to one of the main channels of the Saigon River. The artillery covers the entire area of operations with their fire. Because they are operating semi-independently, the battalion is also supported by a VHF team from the division signal battalion which provides a four-channel system and teletype back to division headquarters at Di An, northeast of Saigon.

In order to reduce casualties due to "jungle rot" the companies operate on a cyclic basis. The normal routine has been two days in operations, two days drying out, and two days on battalion standby, protecting the battalion headquarters and supporting artillery.

While the companies are in the field they are not resupplied, so everything goes in with them in their initial landing by helicopter. The radio operators each carry one spare battery for their AN/PRC-25's which they have found to be more than adequate for the two-day period.

After establishing their company CP, the platoons work in a cloverleaf-type search and destroy pattern around the CP. This is typical of all units in the division. They feel that the cloverleaf allows them to cover the most ground efficiently and quickly.

Every night, the platoons establish ambushes along the waterways. These range in size from a squad to platoon, depending on the waterway and expected or reported activity. Riflemen interviewed stated that the M-16 rifle and the M-79 grenade launchers were excellent for this purpose as both are light and accurate.

*Terrain Region Ib (Figure 19 basic report)

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COMMUNICATIONS PRACTICES

All units in the division have turned in or stored their AN/PRC-6's. The division has received sufficient extra AN/PRC-25's to issue nine to each battalion over and above their normal Table of Organization and Equipment (TO&E). For the operation in the Rung Sat area, the battalion has pooled all AN/PRC-25's and issues one to each squad in the two companies that are in action.

The battalion and companies utilize the standard "book" radio nets, with the companies entering the battalion logistical net as required. Both the battalion and company CPs set up the RC-292 ground-plane antennas in all nets. Different jungle-type antennas have been tried with little or no success.

Patrols normally use the short whip (tape) antennas with the antenna tied down to the operator's belt. They have been found to be effective throughout the area for distances up to 1 - 1.5 kilometers.

Automatic relays were not used at all during this operation. If a unit could not get through, a helicopter was sent aloft to establish communications until such time as the unit was again able to communicate directly. This was normally for short periods only.

The operators have used plastic battery bags to completely enclose the radios. They state that this has cut down on radio outages due to immersion, but they feel that this is an unsatisfactory solution, as it makes the controls hard if not impossible to manipulate. Condensation also poses a problem.

Company officers interviewed voiced general satisfaction with the range capability of the AN/PRC-25's, but stated that occasionally they found that the signal would fade up and down for no apparent reason. They also stated that rain squalls cut the range down drastically.

COMMUNICATIONS PROBLEMS AND RECOMMENDATIONS

1. AN/PRC-25 handsets are leaking water and shorting out as a result. Operators have encased them in plastic battery bags with moderate success.

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2. The tape antenna, if left up, has a tendency to unscrew when the operator walks through the jungle. This is one of the reasons the antenna is tied to the belt. It was also stated that the leaves frequently come apart.
3. Long whip antennas break frequently when the operator walks in the jungle. It was felt that perhaps a more flexible antenna (without the string which also breaks) would possibly work.
4. Both the battalion and company CP have a requirement for a lightweight RC-292 type antenna. In this operation a directional antenna from battalion to company and vice-versa would also be an asset.
5. Lack of operator training was stated as the biggest individual problem. It was felt that all infantrymen should receive more training on the radio, to include practical exercises in how to assemble and properly use the sets and the antennas.
6. Occasionally, mutual interference occurs, however, a few instances of "jamming" were reported. The unit was unable to determine if the jamming was intentional or perhaps a shorted handset within the net.
7. The AN/PRC-25 radios leak, particularly the battery box, on being immersed in water (as occurs frequently in this area). It was stated that leaking has only affected the radio's operation on one or two occasions, but trying to dry the sets out was time-consuming.
8. The unit officers and operators felt that the headset should be issued to all users of the radio. This would free the operator's hands to carry his rifle and would cut down noise at night. It would be particularly useful when riding in helicopters to eliminate the aircraft noise, as all nets are operated continually and must be monitored.
9. The unit utilizes the squelch control for signalling. It was felt that perhaps a simple tone switch for signalling purposes would be useful.

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2/33 FIELD ARTILLERY BATTALION

December 1966

GENERAL

The 2/33 Field Artillery (FA) battalion is a 105-mm Howitzer direct support unit assigned to the 1st Infantry Division. It is part of the division artillery and, as such, receives necessary orders and directives from them. Its base camp, from which it operates whenever possible, is at Lai Khe, north of Saigon. It is normally employed in direct support of the 3rd Brigade, 1st Infantry Division, also located at Lai Khe*.

The battalion's base camp at Lai Khe is on Route 13, at the northeast extremity of the well-known Iron Triangle area. It is located in a former French rubber experimental station. The immediate vegetation consists of rubber trees, neatly aligned, with little or no underbrush. An airstrip, capable of handling up to C-130 aircraft, is also located there. Resupply therefore is either by air or by large truck convoys on Route 13 from Saigon.

The battalion's normal tactical area of operational responsibility (TAOR), which is roughly 25- by 25 kilometers, is generally flat being either rice lands, rubber plantations, or dense jungle. A mountain 986 meters high (Nui Ba Den) in the vicinity of Tay Ninh, some 80 kilometers west of the normal TAOR, is often used as a relay point when communications are otherwise impossible.

The firing batteries are usually assigned a direct support role for a particular infantry battalion, and locate themselves in such a way as to provide fire support over the entire infantry battalion's area of operations. Movement to an area, when possible, is made by road, otherwise the CH-47 (Chinook) helicopter is used to move the unit into position. When a battery is not located in a secure area the infantry unit supported will assist in local security. Often a cavalry platoon from the division will be provided for local security at night. Occasionally, a Civilian Irregular Defense Group (CIDG) will be provided.

*Terrain Region IIb (Figure 19, basic report).

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The battalion (not the batteries) provides forward observers to each infantry company. These forward observers literally become a part of the supported company and live with them continuously. The comment was made that many of the forward observers are not known to the rest of the battalion except as a "voice on the radio." Each forward observer has an AN/PRC-25 for use in the fire nets.

COMMUNICATIONS PRACTICES

The battalion operates in the following nets plus a station in the division artillery command fire net and the brigade command net. The battalion nets and the stations operating in them are:

1. Battalion command net (primary battalion net). This includes the battalion headquarters elements such as the Commanding Officer, Fire Direction Center (FDC) S-3, Executive Officer, Communications Officer, and Brigade Liaison Officer, plus the three firing batteries.
2. Air warning net. This is an artillery advisory net used to advise aircraft entering into the area of operations of artillery fire zones.
3. Three fire channels, used to direct firing batteries; each includes the FDC, one firing battery, one Battalion Liaison Officer, and three forward observers.

Aerial observers, when used, initially enter the battalion command net and then switch to the appropriate firing battery net as required. The aerial observers are using AN/PRC-25's in 0-1 type aircraft until the aircraft are retrofitted with AN/ARC-54's.

All of the battalion nets are VHF (FM). The division artillery net is HF (AM/radio teletype). The battalion normally dismounts the radios (AN/VRC-46's) from the vehicles and places them in the FDC. They operate five radios from the FDC and have experienced little or no mutual interference problems. A 60-foot mast, made of pipe sections, fitted with wooden cross pieces on top, is used to mount five RC-292 antennas.

COMMUNICATIONS PROBLEMS AND RECOMMENDATIONS

1. The AN/PRC-25 and the RT-524 (transceiver component of the AN/VRC-46) are both excellent radios, providing reliable long range communications.

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2. The battery fire nets very seldom get overloaded, even when fire missions are underway.
3. Occasionally the battalion command net does get overcrowded, but this is caused by low priority administrative traffic, and has created no real problems.
4. All radio-telephone operators (RTO) require on-the-job training before they can be properly utilized. It was felt that more training, perhaps in the Advanced Individual Training phase, is required for all personnel.
5. All FDC personnel should receive training as RTOs. They felt they could also use one additional person in the FDC as a combination RTO and switchboard operator.
6. The end sections on vehicular antennas, when used in traveling through wooded areas, are breaking off, necessitating tying antennas down and reducing their efficiency.
7. The forward observers and RTOs could use an earplug-type speaker to reduce the amount of noise produced and still allow them to receive. This is especially true at night.
8. The AN/VRC-46's are heating up, occasionally resulting in failures. After checking and finding nothing the sets were allowed to cool thoroughly and were found to operate. Often the fan is running continuously, even when the set is not transmitting, due to high ambient temperature.
9. The "O" ring in the audio connector makes the connector hard to put on and the troops remove it thus negating the watertight connection.
10. A requirement for a palletized battery, generator supply, and mounting for 5 or 6 sets was voiced. It was also felt that a transformer/rectifier device was required which would allow the FDC radios to operate on 110/220 volts.

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LONG RANGE RECONNAISSANCE PATROL GROUP

1st BRIGADE, 101st DIVISION (AIRBORNE)

November 1966

GENERAL

The Long Range Reconnaissance Patrol (LRRP) group of the 1st Brigade, 101st Division (Airborne) (1/101) operates under the direct control of the Brigade S-2. Its function is solely an intelligence one, namely to determine the presence or absence of significant numbers of the enemy or his installations in a particular area, and to report this information to brigade for further action.

The 1/101 is a separate brigade, operating independently. It has been used in the role of a highly mobile "fire brigade" particularly in the II Vietnamese Corps area. As a result, there is no one particular area of operations which the brigade can call its own. It is typically assigned an area for a particular operation and, upon completing this mission, moves on to another area. Generally, the areas in which the brigade has been employed consist of hilly to mountainous terrain, with a medium to dense jungle canopy interspersed with areas of scrub and grassland, covering much of the hills and valleys*.

The LRRP group normally has four 7-man teams plus a headquarters section. Most of the men in the group have had previous training in either Special Forces or Ranger schools, and all are volunteers to the group. As a result, the esprit of this group is particularly good. They are normally organized for a mission into teams of five men, two of whom are RTOs. All members of the team have received sufficient additional radio training to make them qualified operators.

Three or four teams will normally be covertly inserted in a particular area at one time. Each team will have the mission of acting as either a stationary or moving reconnaissance patrol to observe and report enemy activity in a particular area. The teams will often be located in adjacent valleys so that a relatively large area is being screened.

Terrain Regions IVa and Vc (Figure 19 basic report).

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The teams are inserted via UH-1 type helicopters supported by one or more helicopter gun ships. The insertion method used is that of having the helicopter hover a few feet above the ground rather than land. The men then jump from the aircraft. Each member of the team then independently heads in a prearranged direction to a re-assembly point. The teams radios are kept on the air continuously during this phase, one on the group's tactical frequency and the other on its air-ground frequency. An O-1 will also be used to provide radio contact and relay with the teams during the insertion and link-up phase.

It has become routine in the group to establish a radio relay site, normally within one of the forward battalion CPs located on a clear hilltop*. Automatic retransmission is often used from this location. The AN/PRC-25 is used by the patrols with the short whip antenna tied down to the operator's belt to reduce visibility and noise when traveling through the jungle. The relay and base station use AN/VRC-46 radios with RC-292 ground-plane antennas.

A normal mission lasts from 3 to 5 days with extraction being pre-coordinated and accomplished by helicopter. During extraction an O-1 type aircraft will again orbit the area and provide radio relay, as in the insertion phase.

COMMUNICATIONS PRACTICES

The group maintains two nets during the insertion and link-up phase and during extraction, an air-ground net and the normal command net. As soon as a patrol has assembled, they attempt to contact base, and if successful, they leave the air-ground net and switch both sets to the command net. They report their coordinates utilizing a shackle code and predesignated point of origin code. Upon reaching an appropriate observation point, they again contact base and report their coordinates. The radios are then turned off to conserve the batteries and no further contact is made except at scheduled times. Each radio operator carries one spare battery, but seldom have they had to use them due to the low usage factor on the radios. The batteries have been consistently lasting 5 to 6 days.

Transmissions are scheduled four times daily, unless significant enemy activity is observed. The evening transmission is the

*See Figure 28 of basic report.

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longest of the day, and gives all pertinent data about the team's activities and observations for the day, normally lasting from 5 to 10 minutes. If a station cannot be raised within a reasonable time, after failing to meet a scheduled transmission, an aircraft is despatched to orbit in their vicinity and relay any traffic. The base station and relay remain operational 24 hours per day.

When using the radios the operator keeps the headset flush against his ear and whispers into the microphone so as to reduce the amount of noise he makes. Although minor problems have arisen with this practice it has been found to be generally acceptable. The patrols do not use the back-pack designed for the AN/PRC-25, but rather put the radio into a rucksack because they feel that the back-pack cuts down on their carrying capacity and that it is uncomfortable to wear.

COMMUNICATIONS PROBLEMS AND RECOMMENDATIONS

1. The handsets are prone to leakage and internal condensation causing the handset to short out. The handset is also considered to be too delicate for normal combat operations as it tends to split across the neck.
2. The long antennas on the AN/PRC-25 are clumsy to use and the string breaks too readily.
3. The back-pack for the AN/PRC-25 is considered unsatisfactory.
4. The AN/PRC-25 is an excellent radio which normally far exceeds the book planning distance in range capability. The weight of the set is considered reasonable.
5. The group has attempted to use the AN/PRC-74 (HF-SSB) radio but found them unsatisfactory for their use due to equipment failures and the excessive weight attributed to the 70 BA-30's (plus spares) required to power the set. It was stated that upon receipt of modified radios and wet-cell batteries for the radios, they would again attempt to use them.

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1st BATTALION, 5th REGIMENT, 1st MARINE DIVISION

January 1967

GENERAL

The battalion, which is located at BT 398145 near Chu Lai* is under the operational control of the 1st Marine Division, Task Force X-Ray, a multi-battalion task force which is assigned a search and destroy mission in its TAOR, which consists of coastal lowlands separated by foothills and ridges, rising to the high and rugged interior mountain ranges**.

The battalion is organized conventionally with three infantry companies and a headquarters and service company. The battalion communications platoon, consists of one officer and 73 enlisted men, and is part of the headquarters and service company. The battalion has been assigned the mission of clearing its TAOR. They accomplish this by various forms of patrols, designed to kill or capture enemy personnel encountered and destroy all enemy facilities discovered.

The battalion Command Operations Center (COC) normally controls all battalion patrols. These patrols are usually small in size, having the capability of moving rapidly in the TAOR. These fast moving, frequent patrols have proven to be quite effective, and have resulted in 8 Viet Cong surrendering in the period 2 December 1966 - 7 January 1967.

Communications from the battalion base camp to the patrols along the western perimeter of the TAOR are normally through a manual AN/PRC-25 relay. This method is disliked by the commanders involved, primarily because of their inability to talk directly with the patrols. They accept it, however, as the most practical alternative to no radio contact, or the requirement for heavier, bulkier radios for the patrols. Company size or larger patrols are employed commensurate with the expected enemy strength in the area. All of the TAOR is within range of covering artillery, and patrols call for necessary support through the battalion COC.

The battalion has 65 AN/PRC-25's, 5 AN/PRC-47's, and 3 AN/PRC-41's.

*See Figure 18 of basic report.

**Terrain Regions Va and Vc (Figure 19 basic report)

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COMMUNICATIONS PRACTICES

The battalion operates a primary tactical net which includes all of the companies and other separate units assigned or attached to the battalion. They also have a secondary net which is used primarily for administrative and logistical traffic. The tactical air control party elements of the battalion operate in a separate net with the air support group. The artillery elements maintain a separate fire control net with the forward observers attached to elements of the battalion. The battalion also operates a station in the regimental net. Each company has a separate radio net in which all of the platoons or patrols operating away from the company headquarters have a station. The battalion is assigned seven VHF and HF frequencies to operate these nets. The tactics employed dictate the nature of the communications support.

The volume of traffic handled by these nets is such that there are no major delays in handling the required traffic. The maximum delay in passing traffic occurs when elements of the battalion are involved in a fire fight. It was estimated that the maximum delay during these times was five minutes. The average message length between battalion and its forward units was said to be between 60 - 90 seconds. Although the battalion is authorized and has HF radio equipment, it is used only as an emergency alternate means of communication.

The Chu Lai area is perhaps somewhat unique in Vietnam in that wire communications are normally maintained from the Task Force Headquarters to each of its battalions and, in most cases, from the battalions to each company base headquarters. Sabotage or cutting of the wire lines is reported to be less of a problem than previously, now occurring only infrequently.

The battalion and company base camps usually use the RC-292 ground-plane antenna. Occasionally, patrols will carry the head and antenna elements with them, either placing it on top of a large bamboo pole, or hanging it from the limb of a tree when they want to use it.

The battalion reports instances of establishing reliable communications of up to 50 miles in the coastal area. This range has been reached using AN/PRC-25's and elevated antennas. However, they also remarked on areas within the western portion of their TAOR

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where "dead" spots exist. These dead spots make it impossible to communicate, even though line of sight was reported to exist. No explanation for this phenomenon was offered.

It was remarked that frequently an overcast sky condition reduces the effective operating range of the AN/PRC-25's. This phenomenon has also been reported by other battalions.

The battalion has a one-day message code, but this, too, is rarely used, communications with subordinate elements and patrols being transmitted in the clear using shackle codes where applicable.

COMMUNICATIONS PROBLEMS AND RECOMMENDATIONS

1. On-the-job training is required for personnel newly graduated from communications schools, and for personnel being cross-trained.
2. The AN/PRC-25 batteries were reported to be satisfactory, giving 2-3 days continuous use. The AN/PRC-47 batteries, however, were felt to be unsatisfactory, requiring too much special handling and being too heavy.
3. The "Marathon" battery for the AN/PRC-25 was reported to have an unsatisfactory connector.
4. The H-138 handset, used with the AN/PRC-25, was too delicate for combat operations.
5. The short antenna base on the AN/PRC-25 was not holding up well. It was reported to bend satisfactorily in one direction and to break if bent the other way.
6. An easily used, reliable cipher system for use by patrols is a definite requirement.

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